09.21.2005
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Massage carriage

The invention relates to a massage carriage for use in a massage chair or similar that can be moved back and forth along a frame in the massage chair or similar, comprising a drive, a first shaft that can be moved by the drive and a second shaft that can be moved by the drive, two first arms, which are connected to the first shaft, can be moved by the first shaft and on each of which a massage element is mounted, and two second arms, which are connected to the second shaft and can be moved by the second shaft, one of which each acts on one of the first arms, such that the massage elements can be moved by the drive with one movement component oriented parallel to the frame and one oriented perpendicular to the frame, where the effective length of the second arms, i.e. the distance between the point of connection to the second shaft and the point of action on the respective first arm, is adjustable.

Massage carriages of this kind are known in various designs. In the case of customary use of a massage carriage in the backrest of a massage chair or similar, the two shafts movable by the drive are arranged horizontally and one above the other, e.g. the first shaft above the second shaft. As a rule, the two shafts display eccentric areas at their ends, on which the first or second arms are mounted. In this context, the eccentric area on the ends of the first shaft can be angled relative to this shaft, such that, when the first shaft is rotated, the first arms bearing the massage elements perform a

pivoting movement about an essentially horizontal axis that passes through the intersection of the first shaft and the angled axis of the eccentric areas. The massaging action generated by this movement of the massage elements is referred to as "kneading".

The movement of the second shaft is such that, via its connection by the second arms to the first arms and the movement of the first arms by the first shaft, an essentially vertical movement of the massage elements is generated, possibly with a component oriented perpendicular to the "kneading" movement. The massage action exerted by this movement is also referred to as "tapping".

To generate the "tapping", the second shaft can, like the first shaft, be provided with eccentric areas on its ends, to which the second arms are connected in articulated fashion. Like the first shaft, the second shaft is then rotated by the drive. Instead of rotation, however, other forms of movement are also open to consideration, especially for the second shaft, being induced by the drive and enabling the "kneading" and "tapping" movements of the massage elements described above.

A massage carriage of the type mentioned in the opening paragraph is known from WO-A-03/028615, where the first shaft, located roughly in the middle of the carriage, and the second shaft, located at the top, are driven by laterally opposite geared motors. The first arms, connected in articulated fashion and at an angle on eccentric areas of the first shaft, extend essentially in a horizontal direction from the two geared motors. The free ends of the second arms, which are designed as connecting rods, act in articulated fashion on the ends of the first arms pointing away from the massage elements, said second arms being connected to eccentrics mounted on the second shafts and moved by them. The second arms, designed as connecting rods, display a length compensation feature, the purpose of

which is to compensate for the differences, occurring when the first and second shafts are driven, in the distance between the point of connection to the second shaft and the point of action on the respective first arm.

Owing to this design, the known massage carriage is relatively expansive, especially in the horizontal direction. Its installation, e.g. in the backrest of a massage chair, thus requires a correspondingly large installation depth, in which context the massage carriage is inserted through an opening on the rear side of the backrest of the massage chair. The opening can be closed by means of an externally visible flap.

When the massage function in the backrest of a chair or another item of furniture is not in use, the massage elements of the known massage carriage interfere when in their idle position, in that they cause unpleasant pressure on the back when a person leans back in the chair. The massage elements can also have an unpleasant or even harmful effect on the back when the chair back is moved far backwards or downwards, particularly as a result of a high body weight.

In the massage carriage disclosed in EP-A-1386595, the massage elements can be moved into an idle position upon deactivating the massage function. The distance between the first and second shafts is changed by means of a linear drive for this purpose. In their middle area, the second arms display a joint, the pivoting axis of which runs perpendicular to the second shaft. This joint compensates for parallel movements of the first arms relative to the first shaft.

A massage carriage displaying overload protection for the user is known from JP 04038905 A and the abstract of this printed publication in the Patent Abstracts of Japan, Vol. 016, No. 207 (C0941), May 18, 1992. To this end, the massage carriage comprises a massage unit, the upper end of which is located, in

a manner permitting pivoting about a horizontal axis, on a frame that can be moved vertically in the backrest of a vehicle seat. When a predetermined pressure is exerted on the massage rollers projecting from the massage unit on the end of an arm, the massage unit with the massage rollers is moved into the backrest. The lower end of the massage unit is released from a snap connection to the frame to this end.

The object of the present invention is to develop a massage carriage of the kind mentioned in the opening paragraph in such a way that it can easily be installed in the backrest of a massage chair or another item of furniture, and that it relieves the back of a person using the chair when the massage function is not in use, or when the chair back is moved far backwards or downwards.

According to the invention, the object is solved in that, on a massage carriage of the kind mentioned in the opening paragraph, the first arms are designed, and the first and second arms arranged, in such a way that the effective length of the second arms can be reduced by applying a predetermined pressure on the side of the first arms facing away from the second arms and/or on the side of the massage elements facing away from the first arms, against an initial tension.

As a result of this measure, it is easily possible for the massage elements to be lowered as overload protection for the user and/or into a parking mode position when the massage function is deactivated. When the first arms and the attached massage elements are lowered in this way, the massage carriage takes on relatively flat dimensions, such that it can be inserted into the backrest of a massage chair in the longitudinal direction from below. Following installation, the first arms with the massage elements can then be extended to activate the massage function.

When the massage function is not in use, the first arms and the massage elements mounted on them can be retracted, thereby avoiding what is perceived as unpleasant pressure on the back of the person sitting in the chair.

If it is ensured that the effective length of the second arms is reduced in the event of a high load, resulting from a high body weight or the seat back being moved far backwards or downwards, the retracted second arms form a kind of overload protection for the human back. Unpleasant or even harmful action of the massage elements on the back is avoided, particularly if the length of the second arms is reduced automatically in the event of extreme loading.

In the case where the effective length of the second arms can be reduced by exerting a predetermined pressure on the side of the first arms facing away from the second arms, against an initial tension, the massage elements can be lowered into the parking position by operating elements acting on these sides. In the other case, where the effective length of the second arms can be reduced by exerting a predetermined pressure on the side of the massage elements facing away from the first arms, against an initial tension, overload protection is automatic, such that the back of the user is relieved and health damage avoided. When the load is relieved, the second arms automatically extend back into the normal massaging position owing to the initial tension.

In a preferred embodiment, the second arms display telescopic parts, such that their length can easily be adjusted by retracting and extending these parts.

In this context, the second arms can expediently be designed as pneumatic springs.

In a further embodiment, the second arms can be designed as telescopic spring elements.

Other expedient embodiments of the second arms that permit adjustment of their length are also open to consideration. For example, the second arms can also display a toggle link.

So that the second arms automatically extend again when the load is relieved, a spring element acting against the reduction of the length of the second arms can expediently be provided. This also makes it possible, during a normal massage, to achieve gentle adaptation of the first arms with the massage elements to the contour of the back of the person using the massage chair. If, for example, pneumatic springs are used for the second arms, they and the spring element must be matched in order to achieve this action. Similarly, telescopic spring elements or spring-assisted toggle links can be used for the second arms.

To have the first arms with the massage elements retract when the massage carriage reaches a certain position on the frame, a mechanical or electric trigger element can be provided, whose actuation allows the length of the second arms to be reduced.

position.

Figures 3 and 4 show an additional spring element 10 that increases the spring force of the pneumatic spring. Spring element 10 thus supports extension of the pneumatic spring from the parking position of first arms 3 and massage elements 4, shown in Figs. 3 and 4, into the massaging position.

Spring element 10 also makes it possible to achieve gentle adaptation of massage elements 4 to the contour of the human back during the massage. The pneumatic spring and spring element 10 must be matched to each other for this purpose.

Spring element 10 shown in Fig. 3 is designed as a coil spring 11, one end of which is fastened to a projection integrally molded on the side of the housing of drive 1, the other end acting on the underside of first arm 3.

In the embodiment shown in Fig. 4, spring element 10 comprises a leaf spring 13, one end of which is likewise fastened to a projection integrally molded on the side of the housing of drive 1, the other end resting against the underside of first arm 3 under initial tension.

Figures 5 and 6 shown a practical example in which second arm 6 displays a spring-assisted toggle link 14.

If pressure is exerted on first arms 3 via roller 9 of operating element 8, or via massage elements 4 by bodily force, the two parts 15 and 16 of second arms 6, connected to each other via toggle link 14, are angled relative to each other against the spring force, such that first arms 3 are swung inwards towards drive 1 and massage elements 4 can be retracted.

Massage carriage

Claims

1. Massage carriage for use in a massage chair or similar that can be moved back and forth along a frame in the massage chair or the like, comprising a drive (1), a first shaft that can be moved by the drive (1) and a second shaft that can be moved by the drive (1), two first arms (3), which are connected to the first shaft, can be moved by the first shaft and on each of which a massage element (4) is mounted, and two second arms (6), which are connected to the second shaft and can be moved by the second shaft, one of which each acts on one of the first arms (3), such that the massage elements (4) can be moved by the drive (1) with one movement component oriented parallel to the frame and one oriented perpendicular to the frame, where the effective length of the second arms (6), i.e. the distance between the point of connection to the second shaft and the point of action on the respective first arm (3), is adjustable, characterized in that the first arms (3) are designed, and the first and second arms (3, 6) arranged, in such a way that the effective length of the second arms (6) can be reduced by applying a predetermined pressure on the side of the first arms (3) facing away from the second arms and/or on the side of the massage elements (4) facing away from the first arms (3), against an initial tension.

2. Massage carriage according to Claim 1, characterized in that the second arms (6) display telescopic parts.

3. Massage carriage according to Claim 2, charac-

terized in that the second arms (6) are designed as pneumatic springs.

4. Massage carriage according to Claim 1 or 2, characterized in that the second arms (6) are designed as telescopic spring elements.

5. Massage carriage according to Claim 1, characterized in that the second arms display a toggle link (14).

6. Massage carriage according to one of Claims 1 to 5, characterized in that a spring element (10) acting against the reduction of the length of the second arms is provided.

7. Massage carriage according to one of Claims 1 to 6, characterized in that a mechanical or electric trigger element is provided, whose actuation allows the length of the second arms (6) to be reduced.

8. Massage unit, with a massage carriage according to Claim 7 and a frame along which the massage carriage can be moved, characterized by an operating element (8) located on the frame, by means of which the trigger element can be actuated when a predetermined position of the massage carriage on the frame is reached.

9. Massage unit according to Claim 8, characterized in that the operating element (8) is located in the region of one end of the travel path of the massage carriage along the frame, and designed to apply pressure to the first arms (3) in the direction of the second arms (6).

10. Massage unit according to Claim 8 or 9, charac-

terized in that the operating element (8) displays two rollers (9) in the direction of travel of the first arms (3) of the massage carriage, by means of which the first arms (3) can be pressed towards the second arms (6) when the rollers (9) are reached, where the length of the second arms (6) can be reduced by a pressure component acting in their longitudinal direction.

11. Massage unit according to Claim 9 or 10, characterized by a cutoff device, upon actuation of which the massage carriage is moved to the end of the travel path, where the first arms (3) are pressed against the operating element (8) over a defined distance at the end of the travel path, where the massage elements (4) can be retracted towards the frame due to the resultant shortening of the second arms (6).

12. Massage unit according to Claim 11, characterized by a sensor system, by means of which the drive (1) of the massage elements (4) can be switched off upon reaching a predetermined position of the massage carriage, before the first arms (3) are pressed against the operating element (8).